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(54) Abstract Title

Asynchronous printing of eg internet documents

(57) A method and implementing computer system is provided in which a network user may invoke a print selection mode to quickly identify and queue-up web pages for printing in one continuous batch process. The print selection methodology displays a plurality of selections from which a user may select for the requested print operation. In one example, a user is able to select from a listing of only the hyperlinks available on a target page for subsequent print selection. The user is able to quickly identify and save a list of the selected pages and hyperlinked pages, down to a designated hyperlink depth level, for printing with selected print parameters, and then initiate an asynchronous printing process once for all of the selected pages.

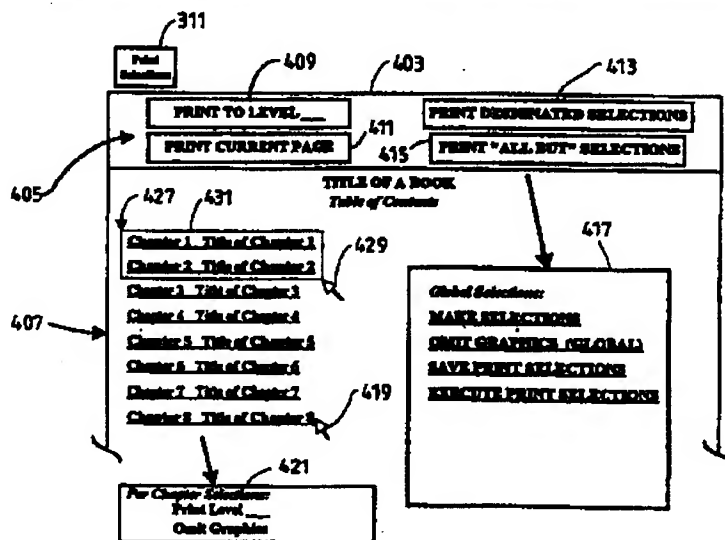
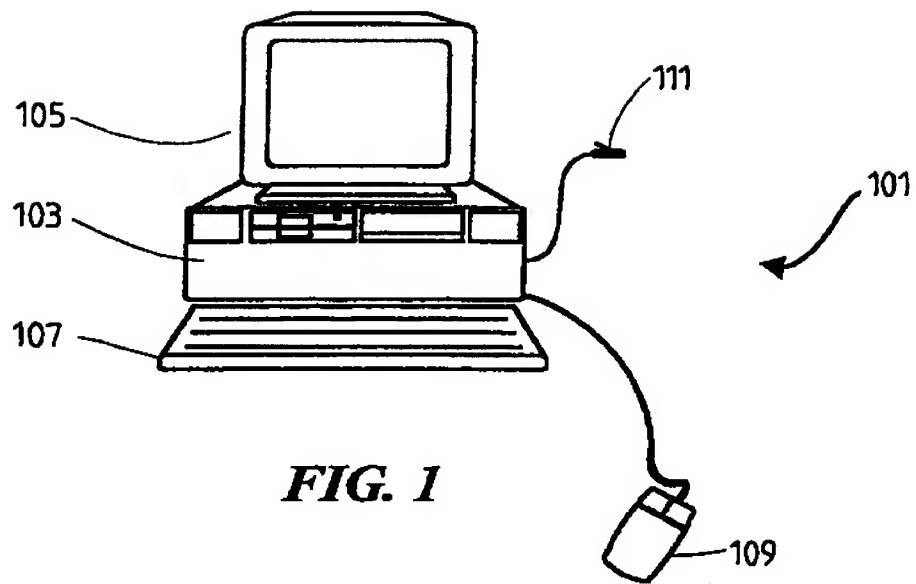
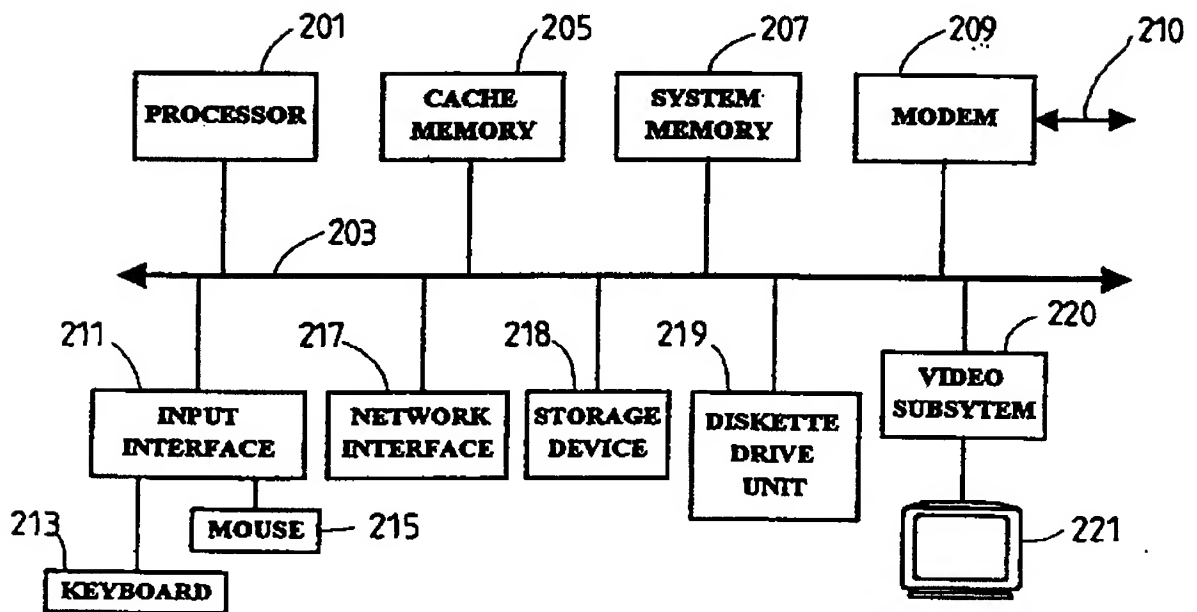


FIG. 4

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**FIG. 1****FIG. 2**

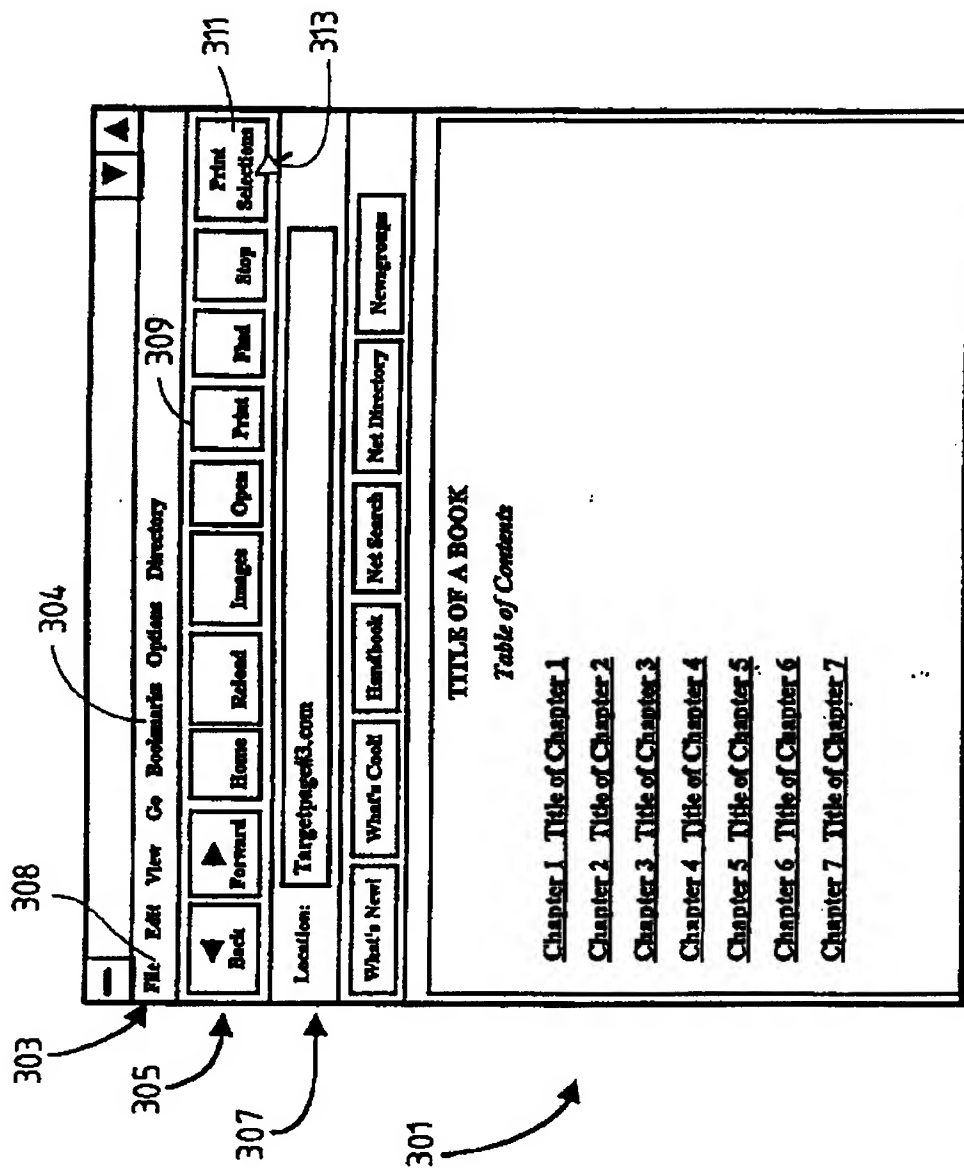


FIG. 3

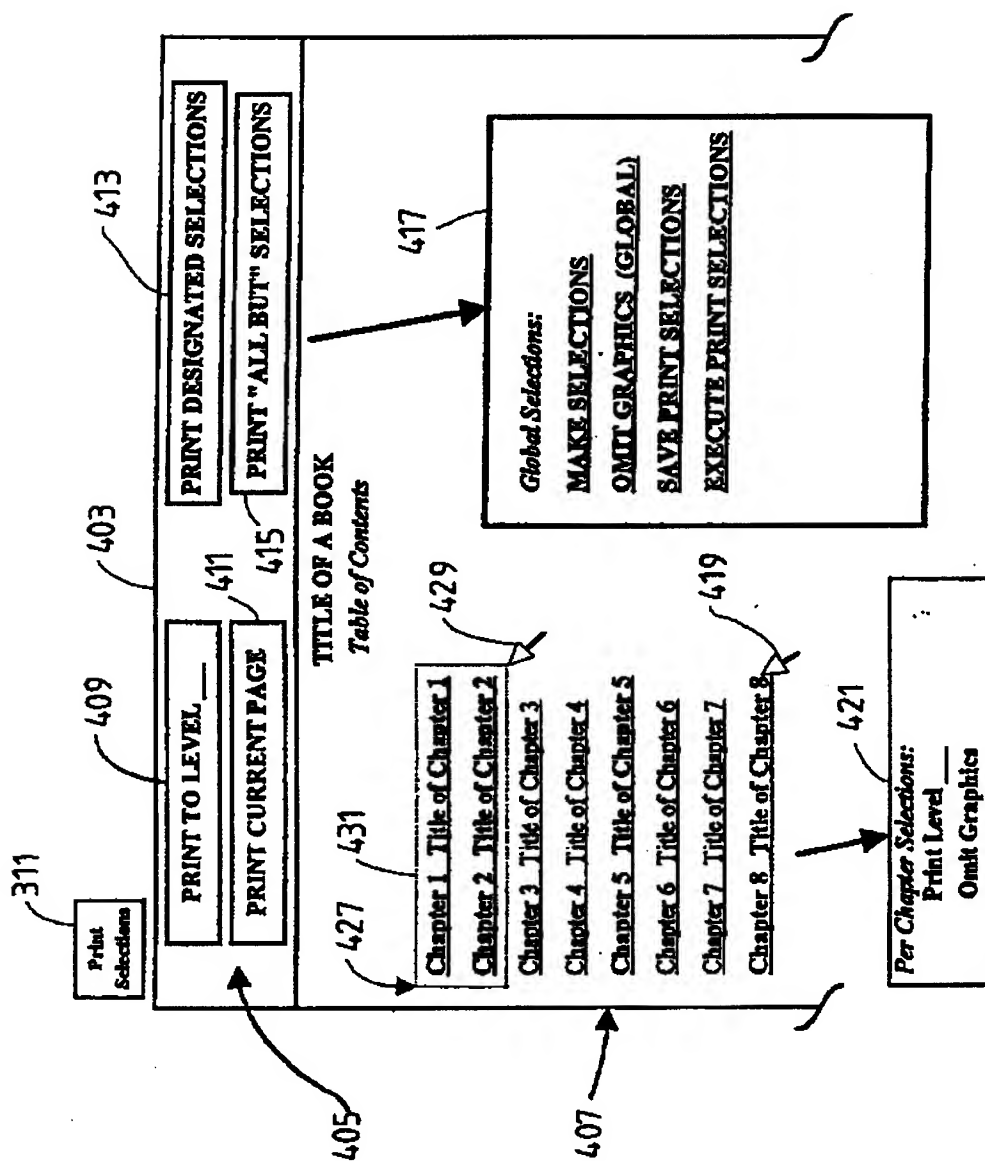
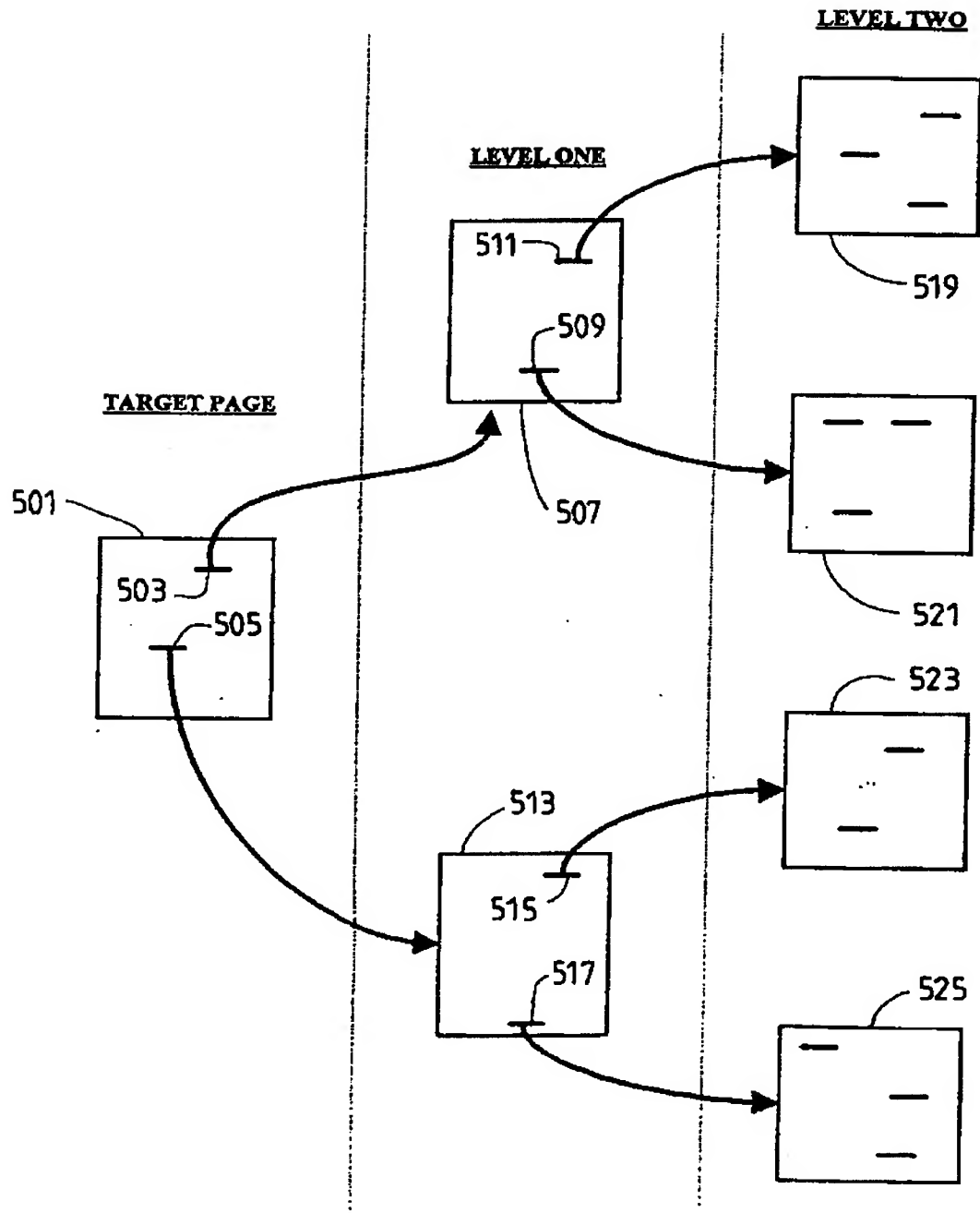
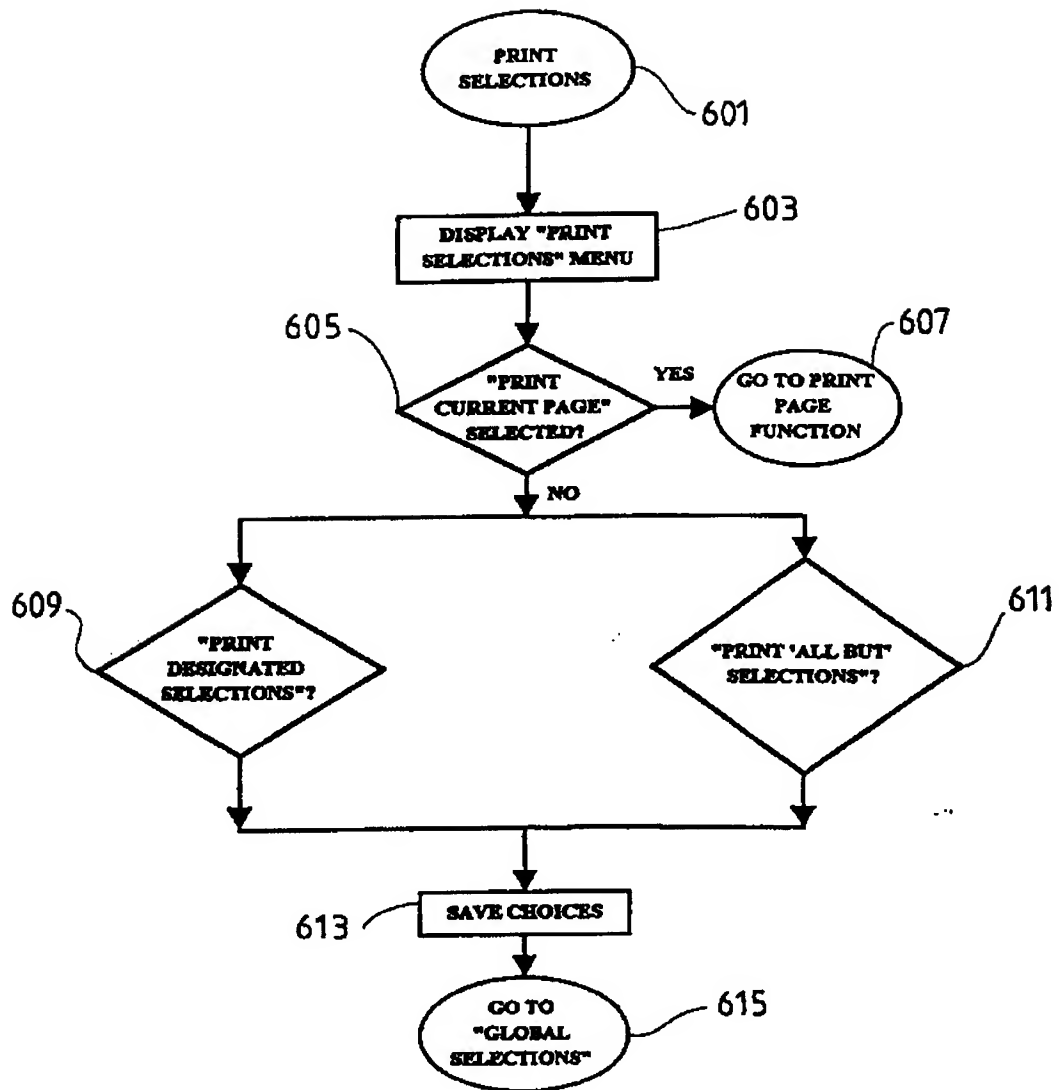


FIG. 4

**FIG. 5**

**FIG. 6**

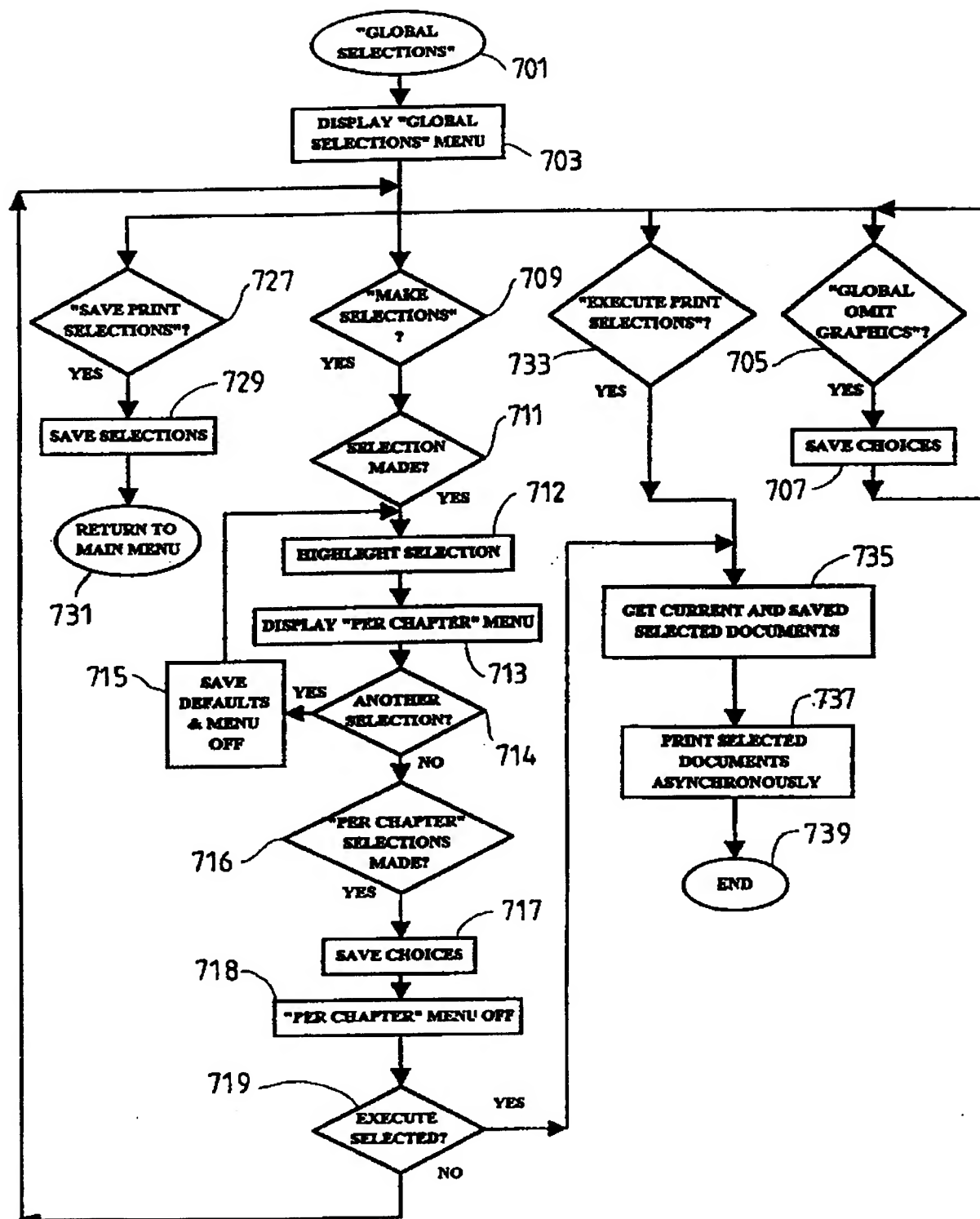


FIG. 7

ASYNCHRONOUS PRINTING OF WEB DOCUMENTS

FIELD OF THE INVENTION

5 The present invention relates generally to information processing systems and more particularly to a methodology and implementation for enabling more efficient document handling techniques for the selection and printing of documents available on a network.

BACKGROUND OF THE INVENTION

10 As computer systems and networked computer systems proliferate, information access time becomes more critical. For many reasons, access time to information databases has a tendency to increase even with
15 frequent equipment upgrades and technology advances. This tendency is apparent in mostly all database accesses which involve telecommunications links and is especially visible to the growing number of users of the Internet and worldwide web applications especially where extensive graphics are implemented.

20 In the internet or "worldwide web" network, a user is able to designate an address of a site or target page where the user desires to "go". The user then enters the selected site and the target page or site home page will be displayed on the user's display screen. In general,
25 target pages with a great deal of graphics content, or even very large text-only pages will take a relatively long period of time to download to a user's terminal. During the interim time period before the target page is displayed, many channels of the network may be "tied-up" in retrieving and forwarding the requested page and information to the user's terminal.
30 This process is not only relatively slow for the user, but it also ties-up the network to some extent, and slows down the same process for other users of the network.

35 Moreover, in cases where a user wishes to print web pages from a plurality of network sites, the user must display each webpage that the user wishes to print, and from the page screen, the user must typically "point-and-click" a mouse device on a "File" then a "Print" selection on a submenu, and further selections for printer designations, for example. After the printing has been accomplished, the user will then typically
40 enter another site or webpage where the user may wish to visit and possibly print, or the user may, in pursuit of a common subject, click on hyperlinks presented on a current page to go to the "next level" of referenced sites which have a common aspect to the current page. When following a "hyperlink" trail, the user must also typically travel page-to-page and wait for the page to download from a web server before going
45 through another print protocol.

When an addressed page does not present the anticipated or sought after information, the user will then have to designate another target address for access. Also, as hereinbefore noted, when a retrieved page contains a great amount of colorful and intricate graphics or sound files for example, the retrieval process takes a relatively long period of time. This occurs because of the great amount of data and parameters that are needed to specify a color graphics display or sound output compared to a textual only display. When several different pages from several different sites are to be printed, there is much lost time in accessing the different sites and downloading from one site for printing before accessing the next site and again invoking the printing protocol. Further, this process is not only a slow process for the user to endure, but the process also slows down the entire network by unnecessarily tying-up network channels which could have been used by other network subscribers. This disadvantage in search or access protocol and webpage printing is even more apparent during periods when there are many millions of subscribers using the network at the same time.

Moreover, it is often cumbersome to print HTML (hypertext markup language) documents because they contain links to other documents. In most applications today, target pages contain "links" to other pages which are related in some respect to the target page or the subject matter of the target page. These "links" are typically observed as a grouping of a few words, which are usually descriptive of the "linked" page to which access is offered. These links are sometimes referred to as "hyperlinks" and the context in which they are presented is referred to as "hypertext". The hyperlinks are generally displayed in bold type and underscored, and may be displayed in a different color, so that a user may easily locate the links on a page which otherwise may be filled with text. A user may "go" directly to one of the displayed linked pages simply by moving a cursor device such as a mouse device to point to an active screen area in which the "hyperlink" is presented within the "hypertext" and "clicking" on a selected enter button on the mouse device.

While the link methodology helps to speed-up a search to some degree vis-a-vis keying-in a new location every time a user desires to move to a new page, the process is still relatively slow, especially where webpage printing is desired. Whenever a hyperlink is selected and "clicked" on, the entire page will be retrieved including all of the graphics and text and graphics-related parameter specification that is necessary. In many cases, a user can determine from a title or hyperlink descriptor whether or not the user wants to print the referenced page. In an example where the main webpage is a table of contents listing the chapters for a book title, the user will generally not need to have all of the chapters in the book printed, but will be able to determine which

chapters the user needs to be printed by viewing the table of contents. Using current techniques, the user will have to click on the designated chapters and download the individual chapters one at a time in sequence, and go through the print protocol with each downloaded chapter, sometimes even on a page-by-page basis, and return to the table of contents before accessing the next chapter for printing.

Further, with existing technology, the creator of the webpage has to create a composite document for the entire book in order to make it simple for the user to print the book. Some recent software products allow a user to gather several documents in a print basket and then print them all later. However, the user still has to fetch each document from the web and then issue the modified print command. Moreover, the process is still synchronous and wastes the user's time and the system's bandwidth.

Thus, there is a need for an improved methodology and implementing network system which enables a more efficient search and print technique for printing network documentation while requiring a reduced amount of network usage time and bandwidth to accomplish.

SUMMARY OF THE INVENTION

A method and implementing computer system is provided in which a network user may invoke a print selection mode to quickly identify and queue-up web pages for printing in one continuous batch process. The print selection methodology displays a plurality of options from which a user may select, either as global or individual parameters for the requested print operation. In one example, a user is able to select from a listing of only the hyperlinks available on a target page for subsequent print selection. The user is able to quickly identify and save a list of the selected pages and hyperlinked pages, down to a designated level, for printing with selected print parameters, and then initiate an asynchronous printing process once for all of the selected pages.

In one embodiment, the invention provides a method for enabling a printing operation for printing a plurality of referenced items designated by indicia presented on a user screen which indicia may be selected by a user during a user network session, said method comprising: displaying a selection screen including a plurality of said indicia, each of said indicia being arranged for selection by a user for printing; saving selections made by the user; presenting a print execution option to the user; and initiating a print operation in response to a user selecting said print execution option, whereby all of said referenced items selected by the user are printed in a designated printing operation.

BRIEF DESCRIPTION OF THE DRAWINGS

5 A better understanding of the present invention can be obtained when the following detailed description of a preferred embodiment is considered in conjunction with the following drawings, in which:

Figure 1 is a diagram of a computer system in which the present invention may be implemented;

10 Figure 2 is a simplified schematic diagram showing selected components and subsystems of the computer system illustrated in Figure 1;

Figure 3 is an illustration of an exemplary display screen of a typical web page for reference in explaining the present invention;

15 Figure 4 is an illustration of an exemplary selection screen used in one embodiment of the present invention;

20 Figure 5 is a simplified schematic illustration of a hyperlink tree structure within an internet system;

Figure 6 is a flowchart illustrating several optional selections within the network methodology disclosed; and

25 Figure 7 is a flowchart illustrating an exemplary operational sequence in one application of the present invention.

DETAILED DESCRIPTION

30 With reference to Figure 1, the various methods discussed herein may be implemented within a typical computer system 101 which may include a workstation or personal computer. In general, an implementing computer system may include a plurality of processors in a multi-bus system in a network of similar systems. However, since the workstation or computer
35 system 101 implementing the present invention in an exemplary embodiment, is generally known in the art and composed of electronic components and circuits which are also generally known to those skilled in the art, circuit details beyond those shown in Figure 1, are not specified to any greater extent than that considered necessary as illustrated, for the
40 understanding and appreciation of the underlying concepts of the present invention and in order not to obfuscate or distract from the teachings of the present invention.

45 In Figure 1, the computer system includes a processor unit 103 which is typically arranged for housing a processor circuit along with other component devices and subsystems of the computer system 101. The

computer system 101 also includes a monitor unit 105, a keyboard 107 and a mouse or pointing device 109, which are all interconnected with the computer system illustrated. Also shown is a connector 111 which is arranged for connecting a modem within the computer system to a communication line such as a telephone line in the present example. The present invention may also be implemented in a cellular system in which case the connector 111 would not be required.

Several of the major components of the system 101 are illustrated in Figure 2. A processor circuit 201 is connected to a system bus 203 which may be any host system bus. It is noted that the processing methodology disclosed herein will apply to many different bus and/or network configurations. A cache memory device 205, and a system memory unit are also connected to the bus 203. A modem 209 is arranged for connection 210 to a communication line, such as a telephone line, through a connector 111 (Figure 1). The modem 209, in the present example, selectively enables the computer system 101 to establish a communication link and initiate communication with another computer system, or network or database server.

The system bus 203 is also connected through an input interface circuit 211 to a keyboard 213 and a mouse or pointing device 215. The bus 203 is also coupled to a network interface subsystem 217 and a diskette drive unit 219. A video subsystem 220, which may include a graphics subsystem, is connected to a display device 221. A storage device 218, which may comprise a hard drive unit, is also coupled to the bus 203. The diskette drive unit provides a means by which individual diskette programs may be loaded on to the hard drive, or accessed directly, for selective execution by the computer system 101. As is well known, program diskettes containing application programs represented by magnetic indicia on the diskette, may be read from the diskette drive, and the computer system is selectively operable to read such magnetic indicia and create program signals. Such program signals are selectively effective to cause the computer system to present displays on the screen of a display device and respond to user inputs in accordance with the functional flow of the application program on the diskette.

In running an Internet access program or browser program on the computer system 101, the access program is typically stored in the storage device 218 and either selectively or automatically, partially or totally, loaded into the system memory 207 when the system is initially powered-on, or at a later time if so desired by a user. The browser is selectively operable to access and execute a site selection program, as herein described, either directly from a diskette in the diskette drive unit 219 or directly from a copy of the site selection program stored on the hard drive unit 218. As a program is running, either a portion of the

program or the entire program may be loaded into the system memory 207 and/or the system cache memory 205. Depending on specific program design, the system may store any information accessed from a database in the storage unit 218, the cache memory 205, the system memory 207 or directly from a diskette loaded into the diskette drive 219. Assuming a user has started-up the system, and is actively running a browser program for example, from memory, a series of screens will be displayed to the user on the display device 221. Each screen typically has one or more selections for the user to make in navigating through the program. In general, a user will make selections from a display screen using the keyboard 213 or the mouse or pointer device 215. In an Internet operating program, the selections made by the user will determine "where" the user "goes", i.e. to what "site" or "webpage", and also, in some cases, the communications link or the path taken to get to the site selected.

Figure 3 illustrates a typical program screen display 301 in an Internet operating session. The browser screen generally includes a mode row 303 which displays several different modes which the user may select such as the "File" selection 308 and the "Bookmarks" selection 304. Another row 305 may be displayed to help a user quickly move through documents, sites, or pages in a network application. An address or "location" section 307 enables a user to key-in, and also displays the name of, an internet address of a site to be, or being, visited. Other quick access buttons may be implemented on the screen for quick access to other selected network services and/or network functions such as "What's New" or "Net Search". In general, any of the illustrated items may be selected through a "point and click" methodology associated with the mouse device 215, and a cursor or pointer indicium visible on the display screen. For example, a download of data from a remote site may be immediately terminated during the transmission by pointing to the "Stop" button and clicking on a designated mouse button. Similarly, the "Back" and "Forward" buttons may be used to return to the last screen display or go forward to the next screen display, respectively.

In the Figure 3 example, the "location" or Uniform Resource Locator (URL) designation is illustrated as "Multichapterbook.com". The exemplary webpage shows a book title along with a "Table of Contents", which lists the chapters in the book in hyperlink format. "Hyperlinks" are typically set out in bold type and underscored, and often displayed in a contrasting color for easy recognition. The hyperlinks typically comprise a grouping of descriptive words which if selected by a user through the positioning and clicking of a pointer will access the page or site which is designated by the link. The hyperlinks activate an access program to the selected site, unlike plain text on the page which merely represents text only without any functional aspect. Through the use of hyperlinks, a user may relatively quickly identify a possible site of interest and

click on the hyperlink to immediately access that site from the current page. Typically, if a user wanted to print one of the chapters, the user would click on the selected hyperlink and the screen would present the book chapter text and could also include additional hypertext and graphics and possibly even include video and/or audio segments for selection. The user could then select the "File" mode and then select the "Print" option to print the chapter selected. If the user wished to print another chapter, the user would return to the "Table of Contents" page by clicking on "Back" for example, then selecting the chapter to be printed, waiting for the retrieval of the selected page with related graphics and hyperlinks, and then go through the "File/Print" protocol again.

However, in the exemplary illustration, a "Print Selection" function button 311 has been added. With the added function, a user may point to the "Print Selections" button with the cursor or pointer 313 and click to invoke the batch selecting and printing process herein described. It should be noted that although the present example shows an access to the "Print Selections" function from a function row on a webpage, the access may be designed to be located in any other convenient screen or screen location. For example, the above referenced co-pending patent application for "Skeleton Page Retrieval Mode For Web Navigation" discloses a method for creating and displaying a "skeleton page" of hyperlinks referenced from a designated webpage, down to a selectable reference depth level. The "Print Selections" button may also be designed to be displayed as part of the referenced "skeleton page" for use in selecting hyperlinked pages for printing. Further, when the "Print Selections" button is selected, the program will de-activate the normal execution of a designated hyperlink such that the user may make a selection of a hyperlink to be printed and the page referenced by the hyperlink will not be called and displayed during the "Print Selections" session.

In Figure 4, there is shown an illustration of an exemplary print selections screen 403 which may be displayed to a user in response to an actuation of the "Print Selections" function button 311. At the top of the menu in the illustrated example is a function-select area 405 for a user to make a first level of choices with regard to the user's printing requirements. As shown, a user may specify the level 409 to which the program should go in assembling hyperlinks and/or web pages for printing. The user may also choose merely to print the current page by clicking on the "Print Current Page" selection 411. The user may also choose either to "Print Designated Pages" to be identified by the user, or to click on the "Print 'All But' Selections" button 415. When the "All But" selection 415 is clicked by the user, the program will print all hyperlinks on the page "except for" the hyperlinks that are selected. This is a useful

function when the user wishes to print most of the entities on the hyperlink page and wishes to exclude only a few.

When the "Print Current Page" selection is made, the program will go directly to a page print function and return to the previous page 301 as shown in Figure 3. A "Print To Level" selection 409 will be entered but the "Print Selections" display will remain on the screen. When the user selects either the "Print Designated Selections" button 413 or the "Print 'All But' Selections" button 415 the program will present a pop-up menu 417 to allow the user to make further "global selections" or selections that will apply to all documents to be selected for printing. An "Omit Graphics" selection may be made so that none of the documents to be selected for printing will include graphics which may be associated with the pages to be printed. The global selections menu 417 may also include a selection to designate that all of the chapters on the page should be printed. That function may, for example, be initiated by clicking on an "Execute" selection prior to making any individual selections from the listing of chapters.

Another selection may be made to "Save Print Selections", which will automatically save the print instructions and documents in a file for future reference. When a user chooses the "Save Print Selections" option from the menu 417, another pop-up input area would appear to allow the user to designate a name for the print job file being designed. The user may then go to another site and save the printing file to add future selections from other web pages. When a user is ready to identify the hyperlinks which are to be printed, the user clicks on the "Make Selections" hypertext from the menu 417. After that action, a user may point-and-click to the chapter items on the listing which the user wishes to have printed or, if button 415 had been previously selected, all of the items except for those now selected will be printed. One exemplary selection device would allow a region on the screen to be specified, e.g., a rectangle, square, circle or polygon or the like, and instruct that all hyperlinks that fall in the boundary (e.g. 431), including the specified number of levels to go down each link, need to be printed. The region could be specified by dragging a mouse or by other means. For example, a user may also point to one of the items or a selected point such as point 427, with the pointer 419, and "drag" the mouse pointer to point 429, to select sequential items (e.g. within box 431) items, or groups of items or chapters for printing. Another option would pop-up a "per-item" menu 421 each time an item is selected to allow the user to determine the "level" of assembly for each item selected as well as a chance to modify the global graphics selection on menu 417 on a "per document" basis from menu 421. Other choices may also be included in the sub-menu 421 to allow individual variations from global selections. After a user has completed the selection process and wishes to proceed with the

print job, the user will click on the "Execute Print Selections" button on the global menu 417, and the program will integrate the selections and instructions and initiate a continuous and asynchronous printing operation to print in one sequence all of the selected documents in the format chosen.

The Figure 5 illustration is helpful in explaining a document's depth "level" for assembling hyperlinks appearing on a webpage in hyperlink format. The referenced technique shows the tree structure through which a skeleton page or hyperlink listing function navigates in assembling a skeleton page or hyperlink listing. From the target page 501, which may contain two hyperlinks 503 and 505, the program would assemble hyperlinks 509 and 511 from pages 507, and hyperlinks 515 and 517 from page 513 if only "one" level were designated for retrieval. If the number "2" were designated as the hyperlink level designation by a user, then the program would also return the hyperlinks listed on the next level of pages, i.e. pages 519, 521, 523 and 525. Hyperlinks are distinctly identified and can be easily accessed from a server site for use in the assembly and display of a hyperlink listing. For example, in HTML, hyperlinks can be identified from a source code listing of the source code used in creating a web page since the hyperlinks are marked by a designation "href". This designation can be observed from a source code listing available at the server site by clicking on "VIEW" from a webpage menu and then clicking on "SOURCE" from the submenu. The "href" code segments which create the hyperlinks on the web page can also be used in creating the hyperlink listing from which a user may select the pages to be printed.

Figure 6 is a flowchart illustrating several optional selections within the network methodology disclosed. When the "Print Selections" button 311 is actuated 601, the "Print Selections Menu" 403 is displayed 603. If the "Print Current Page" selection is made 605, the program goes to an immediate print function 607. Otherwise, a selection of either "Print Designated Selections" 609 or "Print 'All But' Selections" 611 will cause the program to save the selections 613 and go to the pop-up menu 417 for "Global Selections" 615.

Figure 7 is a flowchart illustrating an exemplary operational sequence for the selection portion of the program. When either of the print selections 413 or 415 from the main menu 403 has been selected, the "Global Selections" portion 701 of the program is initiated and the global selections menu is displayed 703. From that point, a user may click on any of four selections, viz. "Save Print Selections" 727, "Make Selections" 709, "Execute Print Selections" 733 or "Global Omit Graphics" 705. When "Save Print Selections" 727 is actuated, the selections made are saved 729 and the program returns 731 to the main menu. When the

"Global Omit Graphics" selection is made 705, the program saves the choice 707 and returns to the Global Selections Menu 417. When the "Make Selections" hypertext is clicked on 709, and whenever a selection is made 711 by pointing and clicking on a listed item or chapter, the selection will be highlighted 712 in the example, and the "per chapter" pop-up menu will be displayed 713 to allow the user to make selections on a per item basis. Optionally, a user may be given an earlier selection (not shown) to include or not include the "per item" pop-up feature.

Within the "Per Chapter" pop-up menu 421, if a user does not wish to further designate specific characteristics of the selected chapter such as the "Print Level" or whether the user wishes to change the global selection for "graphics", the user, after making one selection may proceed immediately to make another selection 714. If another selection is made 714 before specific individual chapter parameters are chosen, the program will save 715 predetermined default parameters, shut down the "per chapter" menu (at least as it is tied to the previously selected chapter), and return to highlight the next selection made 712. If "per chapter" submenu selections are made 716 such as a designation of assembly levels or a choice to omit graphics from the item to be printed, then the choices are saved 717, the chapter submenu is turned-off 718 and a determination is made as to whether "Execute Print Selections" 719 from the global selections menu has been made. If "Execute Print Selections" has been clicked on, the program will to "Get Current and Saved Selected Documents" 735 and proceed to asynchronously print the selected documents 737 with the selected parameters and instructions, and the program will end 739. If "Execute" has not been clicked, the program will return to "Display Global Selections Menu 703 and await further instructions.

One of many possible pseudocode listings which could be implemented to practice the present invention is presented below.

```

print_to_level(level) {
    print_menu(level, print_to_level);
}

designate_selections_and_print() {
    print_menu(level, make_selections);
}

print_by_geometry() {
    print_menu(level, clip_geometry);
}

// level = 0 if only current page is to be printed
print_menu(url, level, flag) {

```

```

// flag = true implies print all but mode
skeleton = get_skeleton(url, level, flag);
if (flag = print_to_level) {
    for each url in skeleton do print_url(url);
5      }
    else if (flag = make_selections) {
    for each url in skeleton do {
        put check_box();
    }
10      wait for print execute command from user;
        for each url in skeleton do print_url(url);
    }
}

15 skeleton
get_skeleton(url, level, mode)
{
    retrieve page specified by url;
    locate_hyperlinks_in_page(url);
20    if (mode = all_but_mode) invert links;
        if (mode = clip_geometry) remove links outside specified
geometry;
        for each hyperlink in page do {
            add link to hierarchical skeleton listing;
25            if (level_to_fetch > 1) process_page(hyperlink, level-1, skeleton);
        }
    return skeleton listing page;
}

30 locate_hyperlinks_in_page(url)
{
    while there is more text in url page
    search for html link;
    add html link;
35    end while
    return links;
}

print_url(url) {
40    if (omit_graphics) strip_away (url, graphics);
        if (omit_file_extension) strip_away(url, file_extension);
        print page;
}

45 strip_away(url, type) {
    parse html for page;

```

```

        if (type = graphics) delete images such as gifs, pngs,
bmps, jpgs;
        else delete by file extensions;
        return page;
5      }

```

In accordance with the above examples, when a user wishes to print a document from the web, a new screen and web page is provided which contains links in the original web page and allows the user to indicate whether the contents of that link need to be printed. The user may so indicate by clicking a dialog box for each page. Fast paths may be included to allow a user to select all links on a page for printing, or only selected ones, or to print "all but" those selected with an inversion operation. The system automatically identifies links that contain printable material and is programmed not to provide a dialog box for listed files that contain non-printable material such as sound files which may be identified by various file names and file name extensions. A user may also select a depth of web pages to be printed. For example, a user may wish to print the links of a "Table of Contents" page and also the links directly referred to, in turn, by each page. Such a listing would have a depth level of "one". Level "two" printing means the user wishes to follow links to another level down i.e. to "first level" links directly referred to from a given page and also those "second level" links referred to on the "first level" pages.

In order to allow a user to interactively select pages to be printed at each level, a "Print Selections" web page is created which contains the names of all the links corresponding to a level chosen by a user. The user may then, for example, mark the pages which the user wishes to print, and make other selections such as whether to include or omit graphics files associated with the selected pages. Further such choices may be made on a global basis or on an individual page basis.

Optionally, files which do not contain printable material may be displayed in a different manner, such as a different color, from the other entries on the base page. Another option would allow a user to designate a "retry" function (not shown) and the program would periodically retry to access and print the selected items if such items are not accessible when a first access is attempted. With the illustrated menus and selections, a user can quickly indicate what pages need to be printed and those pages can be saved and printed asynchronously. Once a user issues a new print command for example, the system can group all of the prior requests and selections by their sites and issue appropriate bundled document fetch requests. By grouping multiple requests, persistent network connections can be maintained so as to avoid start-up overhead delays and bandwidth tie-up for each page.

The method and apparatus of the present invention has been described in connection with a preferred embodiment as disclosed herein. The disclosed methodology may be implemented in a wide range of sequences, menus and screen designs to accomplish the desired results as herein illustrated. Although an embodiment of the present invention has been shown and described in detail herein, along with certain variants thereof, many other varied embodiments that incorporate the teachings of the invention may be easily constructed by those skilled in the art, and even included or integrated into a processor or CPU or other larger system integrated circuit or chip. The disclosed methodology may also be implemented solely in program code stored on a disk or diskette (portable or fixed), or other memory device, from which it may be executed to achieve the beneficial results as described herein. Accordingly, the present invention is not intended to be limited to the specific form set forth herein.

CLAIMS

1. A method for enabling a printing operation for printing a plurality of referenced items designated by indicia presented on a user screen which indicia may be selected by a user during a user network session, said method comprising:

displaying a selection screen including a plurality of said indicia, each of said indicia being arranged for selection by a user for printing;

saving selections made by the user;

presenting a print execution option to the user; and

initiating a print operation in response to a user selecting said print execution option, whereby all of said referenced items selected by the user are printed in a designated printing operation.

2. The method as set forth in claim 1 wherein said indicia include hyperlinks to designated webpages on a network.

3. The method as set forth in claim 2 wherein said webpages are located at a plurality of sites on the network.

4. The method as set forth in any of claims 1 to 3 and further including:

presenting a selection device to a user whereby the user may select a level designation, said level designation being representative of a number of reference levels from which said plurality of indicia is assembled.

5. The method as set forth in any of claims 1 to 4 and further including:

presenting a selection device to the user whereby the user may select to exclude selected ones of said referenced items from being printed.

6. The method as set forth in any of the preceding claims and further including:

presenting a selection device to the user whereby the user may select to exclude predetermined types of data from said referenced items.

7. The method as set forth in claim 6 wherein said predetermined types of data include audio data related to said referenced items.

8. The method as set forth in claim 6 or claim 7 wherein said predetermined types of data include video data related to said referenced items.

9. The method as set forth in any one of claims 6 to 8 wherein said predetermined types include graphics data related to said referenced items.

10. A storage medium including machine readable coded indicia, said storage medium being selectively coupled to a reading device, said reading device being selectively coupled to processing circuitry within a computer system, said reading device being selectively operable to read said machine readable coded indicia and provide program signals representative thereof, said program signals being effective to enable a continuous printing operation for printing a plurality of referenced items designated by visual indicia presented on a user screen, which visual indicia may be selected by a user during a user network session, said program signals being selectively operable to accomplish the steps of:

displaying a selection screen including a plurality of said visual indicia, each of said visual indicia being arranged for selection by a user for printing;

saving selections made by the user;

presenting a print execution option to the user; and

initiating a print operation in response to a user selecting said print execution option, whereby all of said referenced items selected by the user are printed in a designated printing operation.

11. An information processing system comprising:

a processing device;

a memory unit;

a display device;

a printer device; and

a bus connecting said processing device, said display device, said printer device and said memory unit, said processing device being selectively operable for executing a program from said memory for enabling a printing of selected ones of a plurality of referenced items designated by visual indicia presented on a user screen which visual indicia may be selected by a user during a user network session, said system being selectively operable for:

displaying a selection screen on said display device, said selection screen including a plurality of said visual indicia, each of said visual indicia being arranged for selection by a user for printing;

saving selections made by the user in said memory unit;

presenting a print execution option to the user on said display device; and

initiating a print operation in response to a user selecting said print execution option, whereby all of said referenced items selected by the user are printed by said printer device.

12. A network system comprising:

a network server device;

a user terminal device; and

connection means arranged for connecting said user terminal device to said network server device, said network server device being selectively responsive to a signal from said user terminal device for downloading coded indicia from said network server device to said user terminal device, said user terminal device being selectively operable to read said coded indicia and provide program signals representative thereof, said program signals being effective to enable a continuous printing operation for printing a plurality of referenced items designated by visual indicia presented on a user screen, which visual indicia may be selected by a user during a user network session in which said user terminal device is connected to said network server device, said program signals being selectively operable to accomplish the steps of:

displaying a selection screen on said user terminal device, said selection screen including a plurality of said visual indicia, each of said visual indicia being arranged for selection by a user for printing;

saving selections made by the user;

presenting a print execution option to the user; and

initiating a print operation in response to a user selecting said
print execution option, whereby all of said referenced items selected by
the user are printed in a designated printing operation.



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Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.Q): G4A (AKS)

Int Cl (Ed.6): G06F

Other:

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A	WO 97/44747 A1 (BT) eg abstract	-

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.